

AMENDMENTS TO THE DRAWINGS:

The attached sheets of drawings include changes to Figures 1 & 4 marked in red. Two sheets of amended drawings, one of which includes Figures 1 & 2 and one of which includes Figure 4 replace the original sheet including Figures 1 & 2 and the original sheet including Figure 4.

In Figure 1, the film 14 has been completely depicted.

In Figure 4, the numerical designation for the Fermi level has been changed from 40 to 41.

Attachments: Replacement sheet (Figures 1 & 2; Figure 4)

Annotated sheets showing changes to Figure 1 and Figure 4

REMARKS

All pending claims 1-23 have been canceled from this application without prejudice. New claims 24-56 have been added to the application. New claims 24-56 more clearly set forth what it is that the applicants regard as their invention. The drawings and specification are amended above to correct errors that the examiner identified with each. No new matter has been added to the application by way of the drawing, specification and claim amendments.

The examiner's drawing, specification and claim objections and rejections are overcome or they are traversed as set forth below.

I. SUMMARY OF THE INVENTION

The present invention is related to apparatuses and methods for separating different molecules in an admixture of different molecules using a localized photopotential. The apparatuses and methods of the present invention differ from those of the prior art at least because the process and methods are capable of moving molecules in an admixture of molecules by moving the localized photopotential relative to the molecules in a manner that allows for the separation of at least two different types molecules in the admixture.

II. THE DRAWING OBJECTION

The examiner objected to the drawings because (1) Figure 1 did not completely depict film 14; and (2) because numerical designation 40 was used to designate two different features.

This objection has been overcome by:

- (1) Amending Figure 1 to completely show film 14; and
- (2) Amending Figure 4 to designate the Fermi level by number 41 instead of 40.

Marked up and clean amended copies of the figures are attached to this Reply at Appendix A and Appendix B for examiner approval.

III. THE SPECIFICATION OBJECTION

The examiner objected to the specification because the numeral 40 is used to designate two features of the Figures. The examiner also objected to several typographical errors in the application.

The examiner's objections have been overcome by:

- (1) Amending the specification to correct the identified typographical errors; and
- (2) Amending the specification to refer to the Fermi level feature as numeral 41 instead of 40 to conform the specification with the corresponding amendment to Figure 4.

IV. THE CLAIM OBJECTION

The examiner objected to several informalities with the claims. The examiner's objection is rendered moot by the cancellation of all of the objectionable claims from the application.

V. THE ANTICIPATION REJECTION

A. Traverse Of The Gurtner et al. Anticipation Rejection

The examiner rejected claims 1-6, 8-12, 17-21 and 23 under 35 U.S.C. 102(b) as being anticipated by Gurtner et al.

The examiner's rejection has been rendered moot by canceling the rejected claims from the application. The rejected claims have been replaced with new claims that more clearly identify what it is that the applicants regard as their invention.

It is believed that all pending claims are novel in view of Gurtner et al. for at least the following reasons:

- Gurtner et al. does not disclose the apparatus or methods of all of the claims that include an electrically conductive layer having at least two different molecules that are undergoing separation. Instead, Gurtner et al. is directed to moving molecules to an illuminated area without separation.
- Gurtner et al. does not disclose an electrically conductive layer including an admixture of a film material and molecules being separated by the apparatus and methods of claims 27 and 47.
- Gurtner et al. does not disclose an intermittent, modulated, pulsed, chopped, or scanned photon energy source of claims 30-33, 38, 53-54 and 55.
- Gurtner does not disclose applying a voltage using a potentiostat of claim 35.
- Gurtner et al. does not disclose modulating the depletion layer producing voltage potential of claims 36 and 50.

- Gurtner et al. does not disclose an optically transmissive counter electrode of claims 39, and 41-43.
- Gurtner et al. does not disclose using an array of light beams of claim 56.

B. Traverse Of The Kakutani et al. Anticipation Rejection

The examiner rejected claims 1, 3-6, 13-15, and 17-21 under 35 U.S.C. 102(b) as being anticipated by Kakutani et al. (USP No. 5,151,741).

The examiner's rejection has been rendered moot by canceling the rejected claims from the application. The rejected claims have been replaced with new claims the more clearly identify what it is that the applicants regard as their invention.

It is believed that all pending claims are novel in view of Kakutani et al. because Kakutani et al. does not disclose an apparatus or method whereby a surface of an electrode is irradiated with a light source. Instead, the purpose the light provided in Kakutani et al. is absorbed by molecules in solution. Thus, Kakutani et al. does not anticipate the currently claimed invention at least because:

- The photon energy source is not incident upon the semiconductor; and
- No photopotential is generated at the surface of the semiconductor.

C. Traverse Of The Ozkan et al. Anticipation Rejection

The examiner rejected claims 1, 3-4, 10-11 and 13-15 under 35 U.S.C. 102(a) as being anticipated by the Ozkan et al. article.

The examiner's rejection has been rendered moot by the submission of a Rule 1.131 Affidavit signed by one of the inventors – Thomas G. Thundat. The rule 1.131 affidavit of Dr. Thundat demonstrates that the claimed invention was in the possession of the inventors before the November 1, 2001 publication of the Ozkan et al. article. For at least this reason, the Ozkan et al. article is not prior art to the claimed invention.

VI. THE OBVIOUSNESS REJECTIONS

A. Traverse Of The Rejection Of Claims 7 and 22 Over Gurtner et al. In View Of Hafeman

The examiner's rejection of claims 7 and 22 for obviousness over Gurtner et al. in view of Hafeman is rendered moot by the cancellation of these claims from the application. Moreover all pending application claims are believed to be patentable over Gurtner et al. in view of Hafeman for

the same reasons set forth in Section V(A) above.

**B. Traverse Of The Rejection Of Claims 13-15 Over Gurtner et al.
In View Of Ozkan et al.**

The examiner's rejection of claims 13-15 for obviousness over Gurtner et al. in view of is rendered moot because, Ozkan et al. is not prior art to the claimed invention as demonstrated in the Rule 1.131 affidavit that is included with this Reply.

**C. Traverse Of The Rejection Of Claim 16 Over Gurtner et al.
In View of Ozkan et al. And In View Of Jaing et al.**

The examiner's rejection of claim 16 for obviousness over Gurtner et al. in view of Ozkan et al. and further in view of Jaing et al. is rendered moot because, Ozkan et al. is not prior art to the claimed invention as demonstrated in the Rule 1.131 affidavit that is included with this Reply.

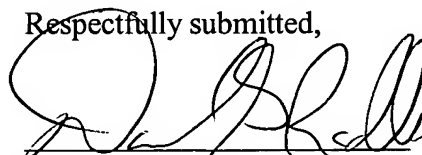
**D. Traverse Of The Rejection Of Claim 16 Over Ozkan et al.
In View Of Jaing et al.**

The examiner's rejection of claim 16 for obviousness over Ozkan et al. in view of Jaing et al. is rendered moot because, Ozkan et al. is not prior art to the claimed invention as demonstrated in the Rule 1.131 affidavit that is included with this Reply.

CONCLUSION

It is believed that the specification, claim and drawing amendments made above, and the statements in favor of patentability presented above overcome and/or traverse all objections and rejections raised by the examiner in the June 11, 2004 Official Action. Favorable reconsideration and allowance of all pending application claims 24-56 is courteously solicited.

Respectfully submitted,



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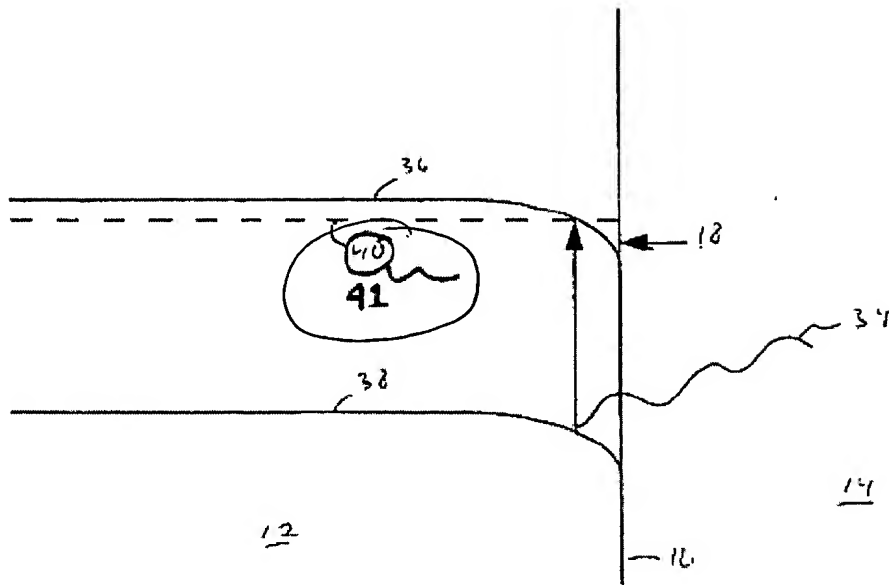


Fig. 4

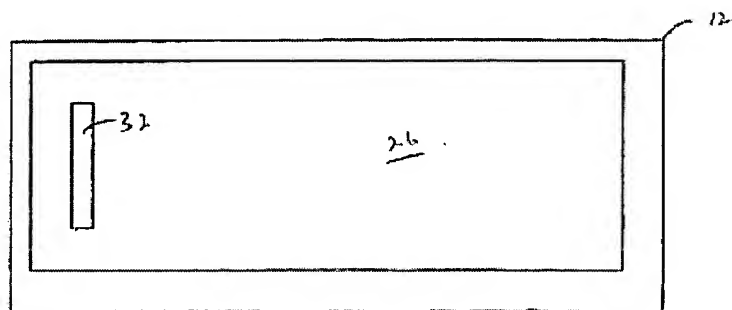
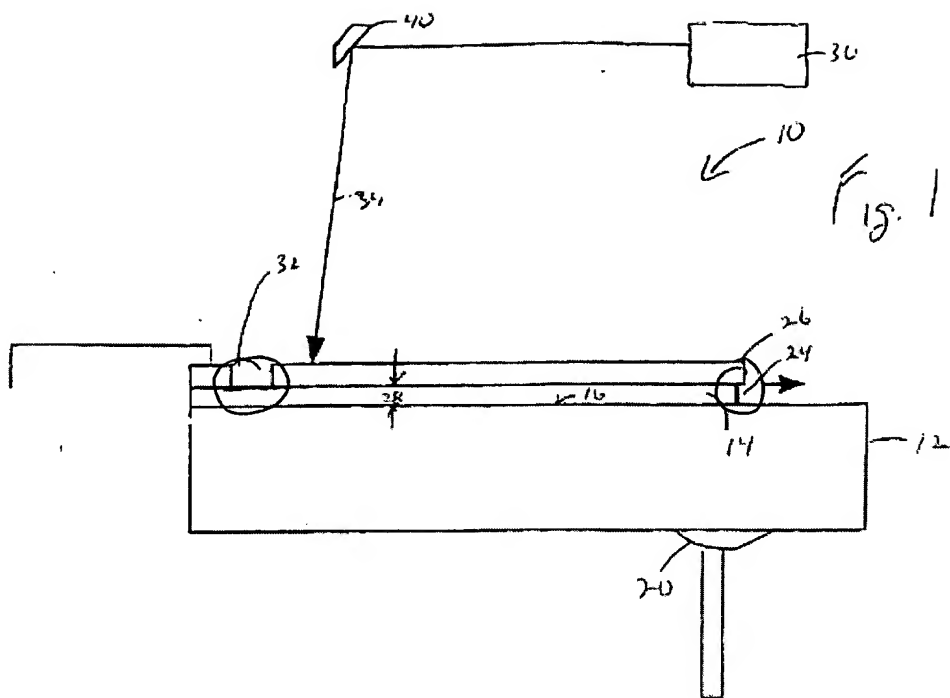


Fig. 2